DRAFT v1
Distance Learning Style Guide
National Highway Institute

This Style Guide describes the standards to be followed when developing Web-based Training (WBT) and Computer-based Instruction (CBI) for the National Highway Institute. This Guide will focus on the following areas:

- Screen Layout
- Menu Organization and Navigation
- Technical Standards
- Instructional Design Standards
- Section 508 Compliance
- Contracting Considerations and Deliverables

Screen Layout Standards

This section defines the standard look and feel for WBT and CBI courseware. These standards are used to maintain style consistency within the following areas:

- General Standards
- Text
- Audio Visual
- Navigation

General Standards

Courseware must comply with the following general standards for screen development:

- Provide a clear, consistent presentation
- Present information in a top down, left to right instructional format
- Provide learners with information in the fewest steps and shortest time possible
- Avoid timed effects. If one or more events are to launch on a screen, the learner should trigger the event. Events should not be timed to launch
- Each screen should address one concept, procedure or item of instruction
- Maintain a consistent writing style on each screen
- Allocate screen locations for the presentation of specific instructions and prompts
- Ensure that vital information is displayed in a prominent location on the screen
- Use consistent color for text and graphics throughout the session
- Develop color combinations with consideration for color-blind learners

- Each color used in the course should have a clear and consistent meaning. Two distance colors should be used for the same purpose
- In text and graphics, use blue, yellow and white carefully, avoiding bright shades and hues that bleed into the background
- Use margins of at least ½ inch at the sides, top and bottom of the screen
- Visual elements, text and audio should avoid stereotyping by race, gender or ethnicity
- Use existing sources of content or media when available
- Audio should be used to augment screen text (when applicable)
- Courseware should be designed for a screen resolution of 800X600 pixels

Text

This section describes the following text elements for courseware

- Text layout
- Text appearance
- Text Language

Layout

Use the following standards for text layout and design:

- Limit the amount of text on screen. Use a PDF format to display long text segments
- Use short lines of 40 – 60 characters
- Design text layout in short segments or phrases
- Use bullets, numbered lists, tables and charts to break up lengthy sentences
- Provide generous white space to separate blocks of text

Appearance

Use the following standards for text appearance:

- Use Arial 14-point or higher font for instructional text
- Use Arial 18-point fonts for screen headings and Arial 16-point ponds for subheadings. A difference of at least two font sizes should be used between each level of text (e.g. title, headings or subheadings)
- Limit the number of fonts on the screen to two
- Bold headings, including on charts and tables
- Do not indent paragraphs

- Use left justification for basic text
- Underline hyperlinks only. Glossary words should be hyperlinks
- Use bold font to emphasize a word or phrase. Avoid using italics, all capital letters, or underlining for emphasizing works or phrases
- Hyperlinks currently being accessed and those that have already been accessed should be identifiable with specific colors or shading
- Do not use blinking text or repetitive animations
- Avoid scrolling text windows

Language

Use the following standards for text language:

- Use active voice, second person (you), present tense, and conversational tone when appropriate
- Keep language simple, concise, and consistent
- Maintain an 8th Grade reading level
- Do not hyphenation to break words
- Ensure humor (if used) is appropriate
- Avoid jargon and slang
- Use examples that are universally understood
- Avoid references that learners with English as a second language would have difficulty understanding
- Use one space after periods and colons
- Maintain parallel construction and noun-pronoun agreement
- Avoid the used on contractions
- Avoid language and examples that will reduce the shelf life of the courseware (e.g., dates, references to current events, etc.)
- Avoid the use of acronyms
- Avoid using all capital letters. Learners have more difficulty reading text that is all capitalized than mixed-case letters (and learners perceive all-cap type as being yelled at)
- Italic should only be used for titles of published works and words that are appropriated from other languages and have not become standard English (i.e., *détente)*

Audio/Visual

This section describes the following audio and visual elements for courseware:

- Audio selection
- General visual elements
- Graphics and photos
- Video
- Animation

Audio Selection

Use the following standards to select audio:

- Include audio into lessons to support the course content and performance objectives
- Narration should be limited to introductory or transitional material or to support the explanation of complex material. Use narration when the message is short, simple, or requires immediate learner responses
- Narration and text should complement, not compete with one another
- When the number "0" is referenced in audio, refer to it as "zero" (not the letter O)
- Audio volume levels should be consistent
- Learner has the option to "Replay" the audio

  Note: Original audio is expensive to produce, and once outdated, requires further expense to update. Existing video can be expensive to re-purpose particularly if outdated technologies were used. Audio also consumes storage and bandwidth, premium resources especially in internet delivery. Use audio judiciously. However, sufficient audio is vital for auditory learners. The instructional designer must balance the considerations.

Visual Elements

Visual elements should relate directly to the content. Use the following standards for developing visual elements.

- Provide recurring information in consistent locations
- Maintain a constant perspective in a series of visuals
- Do not include contractor or other corporate logos in the courseware
- Limit the number of visual elements on a screen
- Re-use graphics to reinforce basic concepts
- Graphically depict concepts to illustrate processes and relationships

Graphics and Photos

Graphics are static visual elements and include clipart, drawings, charts, and tables. Use the following standards for developing or using graphics and photos:

- Avoid using too many visual cues or too many colors
- Avoid graphics that may become outdated in a short time
- Avoid the use to "cartoon" clipart graphics
- Use graphics with colors that complement the background
- Ensure adequate contrast between text and background colors
- Digitize photos and save in the JPG format (consistent web format)
- Create clipart and charts in the GIF format (an internet format to accommodate large files)
- Create tables in an HTML format (to accommodate Section 508 compliance)

Video

Use the following standards to select video for courseware:

- Use video to reinforce, clarify or emphasize a specific behavior or performance objective that cannot be effectively taught using graphics, stills, photographs or animations
- Do not use continuous video clips (more than 15-20 seconds in length) because of file size
- A "Replay" button is available
- Use appropriate video format (e.g., talking head, show and tell, interview, panel discussion, simulation or dramatization)
- Because buffering problems tend to hinder streaming media performance, where possible, avoid traditional techniques such as zooming, panning, transitional wipes, dissolves, and fast motion subjects

  Note: Original video is expensive to produce and once outdated, requires further significant expense to update. Existing video can be expensive to re-purpose, particularly if outdated technologies were used. Video also consumes storage and bandwidth, premium resources in video, especially in internet delivery. Use video judiciously.

Animation

Use the following standards for animation:

- Do not use blinking graphics to text
- Use special effects when required for emphasis or transition. Do not use any special effect that detracts attention from learning
- Use animation to display concepts that are difficult to describe

Menu Organization and Navigation

Menus and navigational elements help learners move through the courseware. Menus guide the learner to modules, lessons and topics while navigational elements allow for maneuvering through the program

This section addresses the standards for:

- Menu organization
- Navigational elements

Menu Organization

- Provide menus for the following levels:
  - **Course Level:** Lists each module in the course. Can display approximate tie length for each module (if applicable)
  - **Module Level:** Lists lessons that are part of each module of the course
  - **Lesson Level:** Lists the topics that are covered in each lesson
- Clear instructions on how to select items from each menu should be provided upon entering the course and from each menu screen
- The Menu should ideally have no more than seven items on it
- The main menu should be well organized and descriptive. Rather than using generic names, such Module 1 and Module 2, use descriptive headings such as Module 1: Introduction and Overview
- Book marking instructions should also be available at these levels
- Group buttons together based on their function and frequency of use
- Use the following common button naming rules:
  - Use Menu to label the button that accesses the main menu. Do not use the ambiguous Main
  - Use Help to access navigational guidance. Do not use Hint or Panic

- Use Exit to end the course. Do not use Quit, End or Stop, which might refer to quitting the immediate exercise or module

- Use Forward or Next and Back or Previous to designate page turning. Do not use Up or Down

- Use complete screen counters such as “1 of 30”, not partial counters, such as “Page 5 that does not indicate how much longer the module will last

Navigation

Learners should spend time mastering the course objectives, not the course navigation. Navigation must be learner-friendly and must comply with the following standards:

- Provide learners with the ability to control al navigational activities

- Navigation must be intuitive for the learner

- Provide clear instructions or cues for all required learner activities

- Navigational elements should be formatted as buttons and should include the following functions:

    - Forward
    - Back
    - Exit
    - Menu
    - Glossary
    - Course Map
    - Tools (when applicable)
    - Help (when applicable)

    Note: Other navigational buttons may be added, as appropriated

- Navigational buttons can be placed anywhere on the screen so they do not obstruct the information being presented.

- The button should be consistent within each course. See the following example for sample placement of a navigation bar:

INSERT SCREEN CAPTURE HERE

- Navigation through the modules and lessons should be primarily learner controlled; however, a suggested sequence should be provided.

- Modules and lessons can be completed in any order, unless the instructional design requires sequential accomplishment (if this is required, instructions to the learners should be provided)

- Identification of module and lesson titles as well as screen numbers sequenced, as Page 1 of 20, should be utilized (learners should be able to identify where they are within the courseware)

- The program should track which modules, lessons, and topics have been completed and provide a visual reference to the learner of what he has completed in the courseware.

- Learners should be able to bookmark their progress in a session

- All buttons and icons should have a consistent and unique appearance

- Visual cues, such as mouse cursor changes and rollover highlights, used on all buttons should be consistent

- All buttons are labeled with text descriptions or with rollover text

- Buttons should “gray out” or disappear when they are inactive

- All non button graphics should have design properties distinct from that of buttons

- Navigation buttons should be displayed in exactly the same screen position every time they appear

- Buttons are grouped logically and located where the learner is likely to be looking

- Learners should have one-click access to Help, Exit and the Main menu

- Every menu should have a title

- Every menu screen should include an option to return to the previous or Main menu

- There should be three or fewer levels of menus

- Menu items should be listed in sequential or logical order

Technical Standards

This section describes standards for specific technical issues related to the courseware. This section includes the following topics:

- Hardware
- Software
- Authoring tools
- Data file structure
- Installation

In addition to these standards, all web development and computer security standards specified by FHWA must be followed. For additional information on these guidelines, please refer to _____.

Hardware

The courseware must be designed to perform on the standard hardware configuration in use at the time of development. For current FHWA hardware configuration, see _____.

Information to determine minimum configuration should include the following specifications:

- Operating system
- Minimum processor speed
- Minimum memory
- Minimum monitor size
- PC video performance
- Standard screen resolution and color depth
- Minimum CD-ROM speed

Software

Any software used to develop or run the courseware must be a standard FHWA application.

Authoring Tools

Courseware should be developed using an authoring tool acceptable to FHWA

Some examples include:

- Author ware
- Toolbook
- Shockwave
- Flash
- Rea Media
- Director
- Front Page
- Dreamweaver
- Others

Data File Structure

Storage formats shown below are examples of the file types. For current FHWA standards, contact _____.

Audio

- WAV format
- MP3 format
- Uncompressed digital files on Digital tape (DAT)

Video

- Compressed digital files – shockwave, AVI, Quicktime, MPEG, Real Media
- Uncompressed files – digital or high quality analog video tapes (VHS is not acceptable)

Animation

- Flash 5 or MX
- Director 8.5

Narrator/Dialogue

- Compressed audio files must be digitized in WAV or MP3
- Uncompressed audio files must be recorded on DAT
- Audio script must be text based MS Word document

Programming Code

- Authoring program
- HTML/JAVA

Flowcharts

- Flowcharts will show the navigation and content for the course and must use VISIO software

Curriculum

- Any design documents used to create the course will be included as MS Word files

Storyboards

- Storyboards will be created in MS word or PowerPoint and updated with final content and programming changes

Graphic and Photos

- Compressed, processed files with ALT text descriptions for Section 508 – JPEG, GIF, PNG are acceptable for web delivery or CD-ROM

- Adobe Photoshop file format with layers is also acceptable for uncompressed files. Adobe illustrator is acceptable for uncompressed files

Instructional Design Standards

General

- An overview of all of the course lessons should be provided on one of the initial courseware screens.

- Time estimates for completion of each lesson and the course, as a whole should be provided.

- Each lesson should begin with a lesson overview that will motivate the learner to continue the lesson.

- If knowledge from a previous lesson or from the learner's work experience is needed to understand the new ideas that will be presented in the lesson, provide a brief summary of this knowledge.

- In addition to application activities, a mastery assessment should be included at the end of each lesson. The mastery assessment differs from practices items in that it is completed at the end of the lesson, intended to test rather than teach mastery.

- Instructional feedback for the mastery assessment should be provided immediately.

- The final component of a courseware lesson is the lesson summary. The summary ties the scenarios and objectives covered in the lesson together.

Interactivity

- The overall design of the courseware should engage the student as frequently as possible. At a minimum, the design should include a learner interaction every four pages.

- Practice opportunities should be present whenever key concepts are complex, require memorization, and/or require multiple attempts to master.

- Practice opportunities are consistent with course objectives

- Practice opportunities have a clear and complete set of activity directions that inform the learner of the process they must follow the time limitations of the exercise (if applicable), the materials they will need to perform the exercise, and whether the activity will be done individually or in groups.

- Practice opportunity directions should state the activity's purpose (i.e., when the learner is doing the activity") and the defined outcome for the activity (i.e., "the desired output").

- Practice opportunities allow the learner to make an incorrect response and to recover from the error.

- Incorporate as much Level II and Level III interactivity as possible. Incorporate where appropriate Level IV interactivity.

    - **Level I** – Passive. The student acts solely as a receiver of information. The student progresses linearly through course reading text from the screen, viewing video or listening to audio.

    - **Level II** – Limited Interaction. The student makes simple responses to instructional cues. The responses may include using a main menu or answering multiple choice or true/false questions.

    - **Level III** – Complex Participation. The student makes a variety of responses using varied techniques in response to instructional cues. Techniques may include building a model/diagram from available parts.

    - **Level IV** – Real-Time Participation. The student is directly involved in a life-like set of complex cues and responses. (Note: This would be a level developed for the style guide but is not something I believe you want to tackle in this RFP. Level IV can be expensive.)

Learner Feedback/Remediation

- Feedback is corrective and supportive to the learner.

- Feedback is gradually withdrawn as the learner practices the new skills.

- When using multiple-choice questions, the learner is given a total of two tries to respond correctly.

- When using multiple-choice questions and the learner selects an incorrect response on the first try, provide the learner with a "hint" to direct him to the correct answer.

- When using multiple-choice questions, if the learner on the second attempt still responds with an incorrect answer, provide the learner with the correct answer.

- When using True/False or Yes/No questions, the learner is given one try to respond correctly. If the learner selects an incorrect answer, they are then provided with the correct answer.

- Avoid using phrases such as "You are incorrect". Instead, use "Incorrect" followed by feedback which provides the learner with a hint prior to attempting the question for a second time.

Grammar and Punctuation

Abbreviations and Acronyms

- Acronyms do not include spaces or periods
- To introduce an acronym for the first time on a page, write out the full name of the entity, followed by its acronym in parentheses
- Abbreviations should be used when using titles before and after names (e.g., Mr., Mrs., PhD, etc.)
- Abbreviations should be used when the acronym for a corporation, institution or country is more familiar than the full name (e.g., USA, IBM, FBI, etc.
- Abbreviations should be used for mathematical measurements (e.g., lb., kg., etc.)

Commas

- Avoid using serial commas immediately preceding “and” or “or” (a serial comma is the last comma in a series of items).

Bullets

- Bulleted or numbered lists should be no more than two levels deep and no more than nine items long.
- Use a colon at the end of the introductory sentence
- Use numbers where sequence is important; otherwise, use bullets
- Begin sentences with caps and end with periods
- Learning Objectives, even when stated in a complete sentence should not end with periods
- Begin phrases (bulleted items that are not complete sentences) with caps and end without punctuation
- Avoid using “and” as well as “or” in bulleted sequences

Numbers

- Use figures to express the numbers 10 and above, all numbers representing mathematical functions or quantities, dates, ages, time, money, and numbers as part of a series
- Spell out the numbers nine and below unless they represent precise measurement
- Spell out any number that begins a sentence, title, or heading
- To pluralize a number, add “s” or “es,” without an apostrophe

Date/Time

- If space is not critical, write out the date in full
- Use a colon to separate the hours and minutes (e.g., 9:00 a.m.)

Em Dash

- An em dash is the same length as a small letter “m”. It is used within a sentence to set off a nonessential element

En Dash

- An en dash is the same length as the small letter “n.” It is used to connect two related elements (e.g., 2003-2004, pp. 28-72, etc.)

Capitalization

- In headlines, capitalize all words except definite/indefinite articles, prepositions and conjunctions that are shorter than four letters.
- When using bullets, capitalize the first word contained in each bullet
- Capitalize the word “State” whenever referring to one of the 50 States
- Capitalize the word “Federal” as in Federal Government
- Do not capitalize the word “federally”

Emphasis

- Use emphasis sparingly to introduce key concepts or important terms
- Avoid excessive use of bolding (it can be distracting and should be reserved for headings)
- Do not use italics for emphasis (they are hard to read on screen, and are used specifically for citations)
- Do not use underlining (it can be confused with a hyperlink)
- Do not use quotation marks (they should be used only for setting off quotations)
- Use headings and subheadings to draw attention to specific concepts
- Break up blocks of text to make it easier for the learner to scan the content
- Use learning objects and page elements to engage learners and focus on specific details of information

Section 508 Compliance

The following statement summarizes Section 508, Part 1194.21 regarding software applications and operating systems:

> *Most of the specifications for software pertain to usability for people with vision impairments. For example, on provision requires alternative keyboard navigation, which is essential for people with vision impairments who cannot rely on pointing devices, such as a mouse. Other provisions address animated displays, color, and contrast settings, flash rate, and electronic forms, among others.*

508 Compliance standards-

Courses must be accessible to persons with disabilities in accordance with section 508 of the Rehabilitation Act Amendments of 1998. Proposals should address how the course would meet the requirements of this Act.

The Contractor will coordinate with the Contracting Officers Technical Representative (COTR) for overall technical direction. The COTR will convene designated U.S. Department of Transportation (USDOT) staff to serve as technical experts, and assist in the review and approval of course materials. Technical experts will represent USDOT, as appropriate.

The *Final Rule, Electronic and Information Technology Accessibility Standards*, published in the Federal Register on December 21, 2000, provides guidance on how a Contractor can meet these requirements (see, 36 CFR Part 1194 [Docket no. 2000-01] RIN 3014-AA25). There are also a number of readily available resources on the Rehabilitation Act including several web sites. See, for example, www.section508.gov and www.access-board.gov. Additionally, a number of organizations provide technical information on making websites accessible for the disabled. Such organizations include but are certainly not limited to:

- The Web Consortium (www.w3.org)
- The HTML Writers Guild (www.hwg.org)
- The Rochester Institute of Technology's Equal Access to Software and Information website (www.rit.edu/~easi/)
- The University of Wisconsin-Madison's Trace Research and Development Center (www.trace.wisc.edu)

See also:

Janet L. Balas. *Online Resources for Adaptive Information Technologies*, Computers in Libraries (June 1, 1999).

Marilyn J. Cohodas. *Does Barrier-Free Compute[correct title?]*, Governing Magazine (April , 2000).

The requirements for Web-based applications as described in § 1194.22 the December 21, 2000 Final Rule, e.g.:

(a) A text equivalent for every non-text element shall be provided (e.g., via "alt", "longdesc", or in element content).
(b) Equivalent alternatives for any multimedia presentation shall be synchronized with the presentation.
(c) Web pages shall be designed so that all information conveyed with color is also available without color, for example from context or markup.
(d) Documents shall be organized so they are readable without requiring an associated style sheet.

(e) Redundant text links shall be provided for each active region of a server-side image map.
(f) Client-side image maps shall be provided instead of server-side image maps except where the regions cannot be defined with an available geometric shape.
(g) Row and column headers shall be identified for data tables.
(h) Markup shall be used to associate data cells and header cells for data tables that have two or more logical levels of row or column headers.
(i) Frames shall be titled with text that facilitates frame identification and navigation.
(j) Pages shall be designed to avoid causing the screen to flicker with a frequency greater than 2 Hz and lower than 55 Hz.
(k) A text-only page, with equivalent information or functionality, shall be provided to make a Web site comply with the provisions of this part, when compliance cannot be accomplished in any other way. The content of the text-only page shall be updated whenever the primary page changes.
(l) When pages utilize scripting languages to display content, or to create interface elements, the information provided by the script shall be identified with functional text that can be read by assistive technology.
(m) When a Web page requires that an applet, plug-in or other application be present on the client system to interpret page content, the page must provide a link to a plug-in or applet that complies with § 1194.21 *[should this be 1194.22 as in the intro sentence to this bulleted list?]* (a) through (1).
(n) Whenever electronic forms are to be completed online, the forms shall allow people using assistive technology to access the information, field elements, and functionality required for completion and submission of the form, including all directions and cues.
(o) A method shall be provided that permits users to skip repetitive navigation links.
(p) When a timed response is required, the user shall be alerted and given sufficient time to indicate more time is required.

Note to § 1194.22: 1. The Board interprets paragraphs (a) through (k) of this section as consistent with the following priority 1 Checkpoints of the Web Content Accessibility Guidelines 1.0 (WCAG 1.0) (May 5, 1999) published by the Web Accessibility Initiative of the World Wide Web Consortium:

Section 1194.22 Paragraph	WCAG 1.0 Checkpoint
(a)	1.1
(b)	1.4
(c)	2.1
(d)	6.1
(e)	1.2
(f)	9.1
(g)	5.1
(h)	5.2
(i)	12.1
(j)	7.1
(k)	11.4

2. Paragraphs (l), (m), (n), (o), and (p) of this section are different from WCAG 1.0. Web pages that conform to WCAG 1.0, level A (i.e., all priority 1 checkpoints) must also meet paragraphs (l), (m), (n), (o), and (p) of this section to comply with this section. WCAG 1.0 is available at:

http://www.w3.org/TR/1999/WAI-WEBCONTENT-19990505

Contracting Considerations and Deliverables

Courseware should not be developed using proprietary authoring tools that preclude future changes by anyone other than the original developer.

FHWA shall hold ownership of the final courseware, including the underlying source code, including all audio, video and graphic files.

The following should be specified as deliverables in contracts for custom courseware development:

- Project Plan
- Draft scripts/storyboards
- Graphics and Animation
- Final script/storyboards
- Beta-test lesson
- Beta-test course
- Final course

Learning Management System (LMS)
Our LMS is provided by Plateau. They are currently in the process of updating the guide for Plateau version 4.2. This provides the detailed information that any contractor will require for development of a Web based course.

Here is the URL for the Plateau Content Integration Guide, which covers AICC, SCORM, and the Plateau Tracking functions.

http://content.plateausystems.com/ContentIntegration/index.htm